APPLICATION BRIEF

MOSTEK

TELECOMMUNICATION PRODUCTS

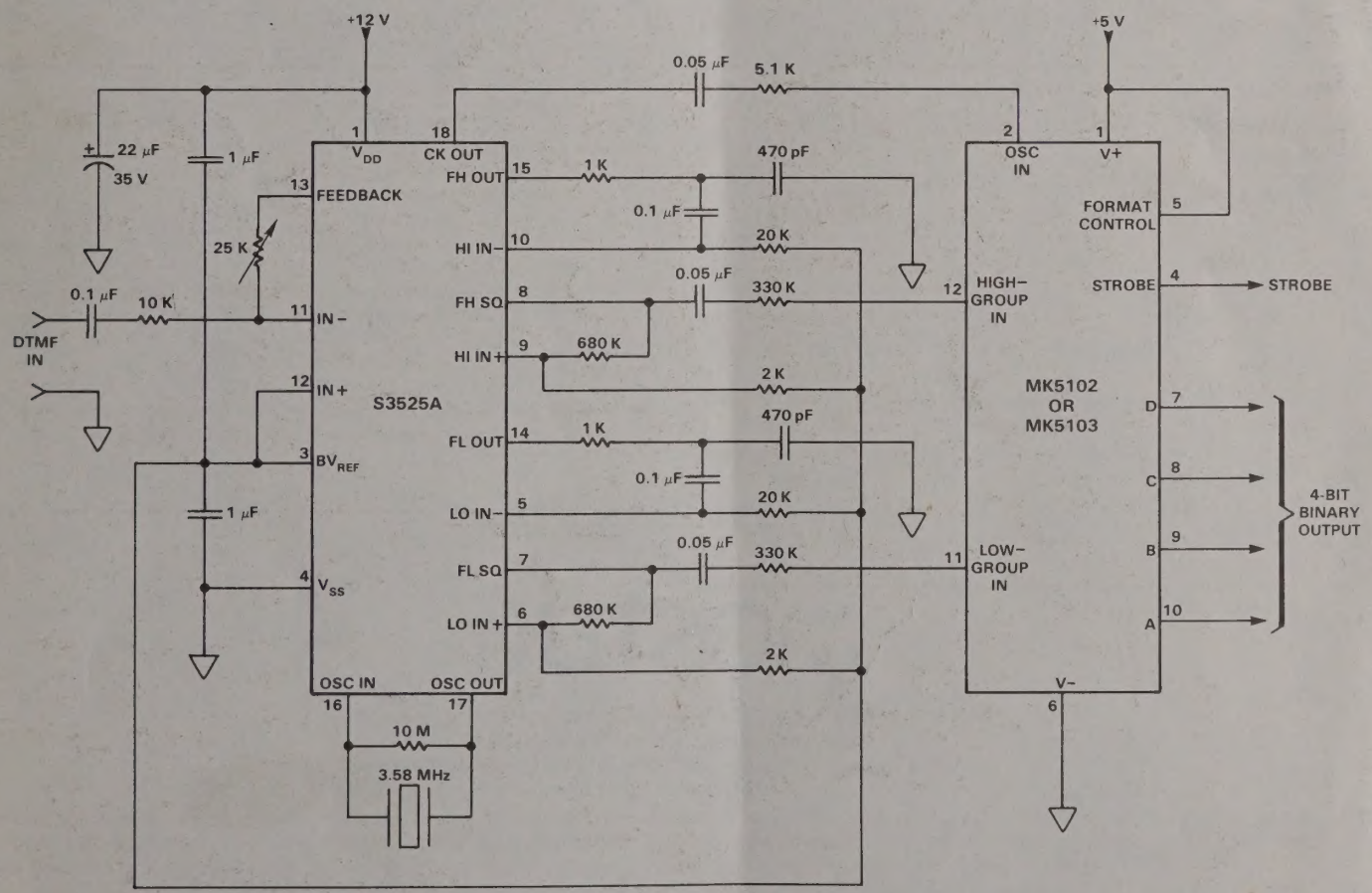
MK5102/S3525A
DTMF Receiver System

An inexpensive DTMF receiver system with a low parts count may be constructed using the Mostek MK5102 or MK5103 Tone Decoder with the AMI S3525A Bandsplit Filter. The S3525A is an 18-pin monolithic CMOS switched-capacitor filter. It uses a 3.58 MHz crystal as a time base and has a buffered clock output to drive the oscillator of the MK5102/3. The S3525A also has on-chip comparators which can be used to construct adjustable squaring circuits.

Using the circuit shown in Figure 1, the duty cycle of the signals provided to the MK5102 should be within the 50 ± 1% range which is required for reliable operation. (Since the MK5103 requires a 50 ± 3% duty cycle, the input signals will be well within its range.) With the potentiometer adjusted so that the filter has unity gain, the results listed in Tables 1, 2, and 3 should be obtained. Tables 1 and 2 show the Mitel test tape (CM7291) results for the DTMF receiver system using the S3525A and the MK5102 or MK5103, respectively. Table 3 shows the Minimum Tone Coincidence Duration for the system using the MK5102 and MK5103 at various input levels.

The operation of the circuit shown in Figure 1 has been verified at temperatures of 0°C, 25°C, and 70°C. However, Tables 1, 2, and 3 show only the data for circuit operation at 25°C.

MK5102/S3525A DTMF RECEIVER SYSTEM
Figure 1



MK5102 WITH AMI S3525A
MITEL TAPE (CM7291) TEST RESULTS

Table 1

TEST #	RESULTS
2a, b	BW = 4.6% of fo
2c, d	BW = 4.9% of fo
2e, f	BW = 4.7% of fo
2g, h	BW = 5.0% of fo
2i, j	BW = 4.8% of fo
2k, l	BW = 4.7% of fo
2m, n	BW = 4.8% of fo
2o, p	BW = 4.7% of fo
3	160 decodes
4	Acceptable Amplitude Ratio = 18.2 dB
5	Dynamic Range = 32 dB
6	Guard Time = 34.8 ms
7	99.0% Successful Decode at S/N Ratio of 12 dB
8	1 Hit on Talk-Off Test

MK5103 WITH AMI S3525A
MITEL TAPE (CM7291) TEST RESULTS

Table 2

TEST #	RESULTS
2a, b	BW = 5.0% of fo
2c, d	BW = 5.1% of fo
2e, f	BW = 4.9% of fo
2g, h	BW = 5.2% of fo
2i, j	BW = 5.1% of fo
2k, l	BW = 5.0% of fo
2m, n	BW = 5.2% of fo
2o, p	BW = 5.1% of fo
3	160 decodes
4	Acceptable Amplitude Ratio = 19.1 dB
5	Dynamic Range = 32 dB
6	Guard Time = 32.5 ms
7	99.9% Successful Decode at S/N Ratio of 12 dB
8	1 Hit on Talk-Off Test

MK5102/3 WITH AMI S3525A
MINIMUM TONE COINCIDENCE DURATION

Table 3

Input Level dBm (600 Ω)	MK5102 Decode Time	MK5103 Decode Time
-28 dBm	43.4 ms	38.9 ms
-25 dBm	37.4 ms	34.7 ms
-20 dBm	37.0 ms	34.7 ms
-10 dBm	36.3 ms	28.8 ms
0 dBm	37.3 ms	28.8 ms
+6 dBm	36.5 ms	28.9 ms

NOTES:

1. More information regarding the S3525A is available from:
   American Microsystems Inc.
   3800 Homestead Rd.
   Santa Clara, CA 95051
   Telephone: (408) 246-0330
   TWX: 910-338-0018
2. More information regarding the MK5102 and MK5103 is available from:
   Mostek Telecom Dept.
   1215 W. Crosby Rd.
   Carrollton, Texas 75006
   Telephone: (214) 323-1000
3. The AMI S3525A used in this evaluation was a typical part. Slightly different results may be obtained depending upon the particular S3525A used.

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